Autumn Examinations 2010/ 2011

Exam Code(s)	4IF121
Exam(s)	B.Sc. in Information Technology
Module Code(s)	CT417
Module(s)	Software Engineering III
Paper No.	1
External Examiner(s)	Prof. Michael O'Boyle
Internal Examiner(s)	Prof. G. Lyons Dr. Jim Duggan Dr. Owen Molloy Ms. Karen Young Ms. Pat Byrne
Instructions:	Candidates should attempt four questions, two questions from each section. All questions carry equal marks ***Use separate answer books for each section***.
Duration	3 hours
No. of Pages	4

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ No ☐

SECTION A
(Project Management)

1. (a) In the context of Risk Management, give two examples of each of the following types of risks and how best they can be identified:

Customer risks
Business risks
Application risks

(9)

(b) Create a prioritised risk assessment table for the following software system:

You have been asked to build software to support a low-cost video editing system. The system accepts digital video as input, stores the video on disk, and then allows the user to do a wide range of edits to the digitised video. The result can then be output to DVD or other media.

(10)

(c) Develop a risk mitigation strategy and specific risk mitigation for 2 risks in your table.

(6)

2. (a) Assume that you are a project manager for a small software products company. To maintain competitiveness in the market, the company wants to offer its customers a mobile application for its flagship product which customers can use as an alternative client. You will be involved in the project design phases but the project management team would like your inputs whilst developing the initial project plan.

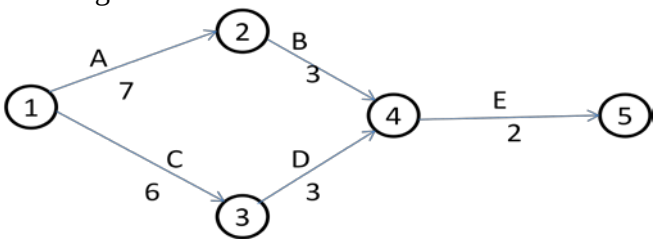
Which software development process model(s) would you recommend for this project? Give precise reasons for your choice(s). Outline any assumptions you make in constructing your recommendation.

(15)

(b) The IT department has its own methodology for doing software development. The engineering department has its own methodology for doing new product development. Teams from both departments are brought together to develop a new product with a significant software component. The IT team has decided that this is an agile project and they will use the Adaptive Project Framework (APF) model. The engineering department has always used a linear PM model and has no intention of changing it now. You are the PM, how would you solve this problem?

(10)

3. (a) The following network diagram represents the work done in developing a two-week computer training course:



The table below shows the normal cost and the crash cost and time for each activity on the diagram. All costs are in euro, for the total activity.

	Activity	Crash time	Crash cost	Normal time	Normal cost
A	Obtain instructor	4	800	7	500
B	Locate a room	2	350	3	200
C	Check costs	4	900	6	500
D	Room open	1	500	3	200
E	Schedule class	1	550	2	300

(i) Find the crash cost per day.
(ii) Which activities should be crashed to meet a project deadline of 10 days with a minimum cost? Assume partial crashing.

(15)

(b) You have been project manager on a software development project and have found that one particular programmer is not working well with his colleagues. He has only recently come to this country and you are unsure whether the problems lie in that fact that he has difficulties integrating into a different work culture, or whether his workmates are not including him fully in office activities. Describe the steps you might take in dealing with this problem.

(10)

4.(a) The city council have decided to set up a bicycle-share scheme to enable short journeys within the city. Bicycles are kept at a number of parking stations throughout the city, and members of the public can borrow and return a bicycle to these at any time. Rental charges are based on an annual fee and then a sliding scale per hours rental. All fees are automatically deducted from a registered credit card. They system must also keep track of the location of bicycles and report on the number of bicycles (or parking spots) free at each location and publish this on the internet. Details need also be kept so that bicycles might be maintained in good working order.

Describe the steps you might take in creating a cost estimate baseline for the full computer system (software, hardware and installation) which you are to present to management.

(15)

(b) Describe the steps you might take in deciding whether or not to outsource the software part of the system described above, and list any particular details which you might want to include in the contract if the decision is to have this piece of work written by an outside supplier.

(10)

SECTION B

(Quality – Dr. Owen Molloy)

5. (a) Three stakeholders (online shopper, clothes manufacturer and site owner) in a project to develop a new online retail shopping site are asked to define the quality of the site with respect to their needs, and the top attributes they would use to measure quality. For each of the stakeholders give what you think their definitions of quality and quality attributes would be.

[10]

(c) You are asked to carry out a Kano analysis of the camera capability of a mobile phone. Explain how you would carry this out and how you would present your results.

[15]

6. (a) A software company doing bespoke development for clients has been having issues with productivity and error rates in the software. Assuming you use the DMAIC approach to manage a project investigating this problem, create a Project Charter for the project.

[15]

(b) For the M (Measure) phase of the above project, describe in as much detail as possible what data you would need to collect, and how you would collect and present it.

[10]

7. You have recently joined the QA team in a large software organisation. You have been asked to initiate a process for Code Reviews. Describe the following:

- The advantages of performing code reviews
- Potential issues which might be encountered
- The roles which you think should be filled in each review team
- How reviews should be conducted

[25]

8. (a) You have noticed that there is a large degree of variability in the defect rates achieved in different software projects. Describe how you would go about conducting Brainstorming and Root Cause Analysis to determine potential causes of variability. Draw a Fishbone diagram to illustrate your answer.

[15]

(b) Describe (using examples) how tools such as Check Sheets, Pareto Charts, Histograms, Scatter Charts and Control Charts might be used to help in your analysis of data collected following-up on the brainstorming sessions.

[10]